

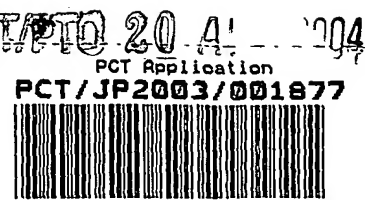
Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



10/505141

Applicant's or agent's file reference P044090	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP03/01877	International filing date (day/month/year) 20 February 2003 (20.02.03)	Priority date (day/month/year) 21 February 2002 (21.02.02)
International Patent Classification (IPC) or national classification and IPC C01G 45/02, H01M 4/58, 10/40		
Applicant TOSOH CORPORATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 24 July 2003 (24.07.03)	Date of completion of this report 13 November 2003 (13.11.2003)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP03/01877

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP 03/01877

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	8-11	YES
	Claims	1-7, 12	NO
Inventive step (IS)	Claims	8-11	YES
	Claims	1-7, 12	NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims		NO

2. Citations and explanations

Claims 1 to 7, 12 (lack novelty, inventive step)

Document 1 (JP 2001-143687 A (Kao Corp.)) cited in the international search report discloses a lithium manganese composite oxide sintered body having connected pores and a porosity of 15 to 60%. Document 1 cited in the international search report discloses the use of the above sintered body as a positive electrode on a secondary cell. A person skilled in the art could easily conceive of making the invention of the present application by shaping the aforementioned sintered body into a spherical shape or the like for use as a material for a positive electrode on a secondary cell (document 1 cited in the international search report, claims, paragraphs [0011], [0013], and [0017], and working examples).

Document 2 (JP 2002-053321 A (Titan Kogyo K.K.)) cited in the international search report discloses lithium manganese composite oxide secondary particles having an average diameter of 1 to 100 μm and a specific surface area of 0.1 to 10 m^2/g . The lithium manganese composite oxide secondary particles of the invention disclosed in document 2 are obtained using a method wherein compounds

such as a manganese oxide and lithium carbonate are spray-dried and then fired at a temperature of 500 to 1000°C (the same method used in the present invention), and are thus recognized as fulfilling the specifications of the present invention, such as open pores and the like (document 2 cited in the international search report, claims, paragraphs [0015] to [0025], and working examples).

Document 3 (WO 01/004975 A (Showa Denko K.K.)) cited in the international search report discloses lithium manganese composite oxide secondary particles having a porosity of 15% or less. Document 3 indicates that the specific surface area of the lithium manganese composite oxide secondary particles is $1.8 \text{ m}^2/\text{g}$ or less (see working examples), and that particle diameter is 10 to 20 μm (document 3 cited in the international search report, claims, page 13, line 6 to page 14, line 6, page 14, lines 27 to 30, working examples, and tables 1 to 3).

Claims 8 to 11 (are novel, involve an inventive step)

Documents 1 to 4 cited in the international search report do not disclose a method for producing lithium manganese composite oxide granular secondary particles characterized in that a slurry containing an agent for forming open pores is spray-dried to form granules. As a result of this feature, the present invention achieves the advantageous effect of being able to control pore volume (see the present application, description, page 7, lines 2 to 6).